

11-14-05

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PATENT

10/649,989



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Vladislav Vashchenko, et al.

Appln. No.: 10/649,989

Filed: August 27, 2003

For: SILICON CONTROLLED RECTIFIER
STRUCTURE WITH IMPROVED PUNCH
THROUGH RESISTANCE

Group Art Unit: 2814

Examiner: Long Pham

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is an appeal from the decision dated May 16, 2005 of the Examiner finally rejecting claim 22.

Real Party in Interest

The real party in interest is National Semiconductor Corporation as indicated in the assignment recorded at reel 014447, frame 0420-0423, on August 26, 2003.

Related Appeals and Interferences

Appellant is not aware of any other related appeals or interferences.

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Appeal Brief

Atty. Docket No. 100-22600
(P05659)

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Status of Claims

Claim 22 stands rejected under 35 U.S.C. §102(b) as being anticipated by Sutton (U.S. Patent No. 4,937,647).

Claims 1-4, 6-13, 21, and 23-28 have been allowed.

Claims 5 and 14-20 have been cancelled.

Claim 22 is being appealed.

Status of Amendments

Appellant's amendment filed on July 14, 2005 was entered into the case.

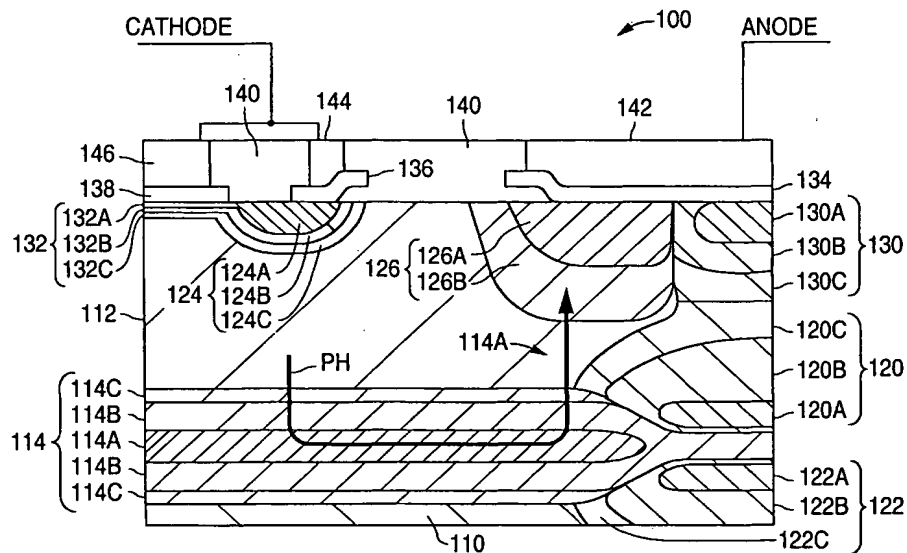
Summary of Claimed Subject Matter

The subject matter of independent claim 22 is shown in appellant's FIG. 1 (reproduced below), and is a silicon controlled rectifier. The silicon controlled rectifier of claim 22 includes a first semiconductor region of a first conductivity type that has a dopant concentration. (The first semiconductor region can be read to be, for example, n-type epitaxial layer 112 shown in FIG. 1 and discussed on page 2, lines 21-26 of appellant's specification.)

The silicon controlled rectifier also includes a buried region of the first conductivity type. The buried region contacts the first semiconductor region and has a dopant concentration that is greater than the dopant concentration of the first semiconductor region. (The buried region can be read to be, for example, n-type buried layer 114 shown in FIG. 1 and discussed from page 2, line 27 to page 3, line 9 of appellant's specification.)

The silicon controlled rectifier further includes a second semiconductor region of a second conductivity type that contacts the first semiconductor region. The second semiconductor region is spaced apart from the buried region. The second semiconductor region includes all contiguous regions of the second conductivity

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**FIG. 1**

type. (The second semiconductor region can be read to be, for example, p-type region 124 shown in FIG. 1 and discussed on page 4, lines 8-17 of appellant's specification.)

The silicon controlled rectifier additionally includes a third semiconductor region of the first conductivity type that contacts the first semiconductor region. The third semiconductor region is spaced apart from the buried region and the second semiconductor region, and has a dopant concentration that is greater than the dopant concentration of the first semiconductor region. (The third semiconductor region can be read to be, for example, n-type sinker down region 126 shown in FIG. 1 and discussed on page 4, lines 18-24 of appellant's specification.)

Grounds of Rejection to be Reviewed on Appeal

Claim 22 stands rejected under 35 U.S.C. §102(b) as being anticipated by Sutton (U.S. Patent No. 4,937,647).

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Argument

Rejection under 35 U.S.C. §102(b) as being anticipated by Sutton (U.S. Patent No. 4,937,647).

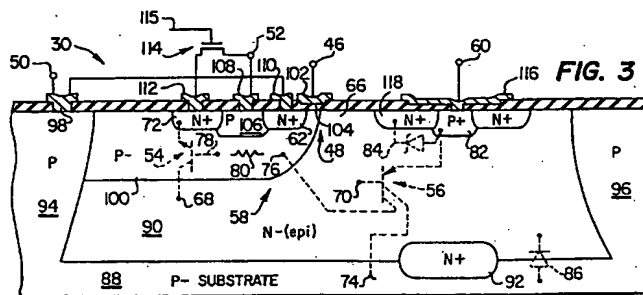
Claim 22

Claim 22 recites, in part,

"a buried region of the first conductivity type, the buried region contacting the first semiconductor region and having a dopant concentration that is greater than the dopant concentration of the first semiconductor region;

"a second semiconductor region of a second conductivity type that contacts the first semiconductor region, the second semiconductor region being spaced apart from the buried region, the second semiconductor region including all contiguous regions of the second conductivity type."

In rejecting the claims, the Examiner pointed to n+ buried layer 92 shown in FIG. 3 (reproduced below) of the Sutton reference as constituting the buried region of claim 22, and p-type diffusion 96 shown in FIG. 3 of the Sutton reference as constituting the second semiconductor region of claim 22. P-type diffusion region 96, however, can not be read to be the second semiconductor region required by claim 22.



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As noted above, claim 22 requires that the second semiconductor region include all contiguous regions of the second conductivity type. The term "contiguous" in this context means the regions that are in contact and have the second conductivity type. For example, one common usage of the term "contiguous" is with reference to the 48 contiguous states of the United States. Similarly, as shown in FIG. 3 of the Sutton reference, p- substrate 88, p region 94, p region 96, and p- region 100 form a single contiguous region because the regions are in contact and have the same conductivity type.

Thus, even though p- substrate 88 and p region 96 have different dopant concentrations, these two regions form a single contiguous region because both regions are in contact and have the same conductivity type. As a result, p-type diffusion region 96 and p-type substrate 88 must both be read to be a part of the second semiconductor region required by claim 22.

In addition, as further shown in FIG. 3 of the Sutton reference, p-type substrate 88 contacts n+ buried layer 92. Thus, since p-type substrate 88 contacts buried layer 92, and p-type substrate and p-type diffusion 96 must be read together to be a part of the second semiconductor region, the Sutton reference teaches that the second semiconductor region contacts buried layer 92.

However, as noted above, claim 22 requires that the second semiconductor region be spaced apart from the buried region. Thus, since the Sutton reference teaches that the second semiconductor region (which includes substrate 88 and diffusion 96) contacts buried layer 92, the Sutton reference can not anticipate claim 22.

In responding to appellant's argument, the Examiner argued that "the limitation that p-type diffusion region 96 and p-type diffusion region 88 must both be a part of the second semiconductor region is not recited by present claim 22." However, as noted above, claim 22 requires that the second semiconductor region include all contiguous regions of the second conductivity type.

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Thus, in view of the definition of the term "contiguous," claim 22 does require that p-type diffusion region 96 and p-type substrate 88 be read to be a part of the second semiconductor region. Therefore, since the Sutton reference teaches that the second semiconductor region (which includes substrate 88 and diffusion 96) contacts buried layer 92, claim 22 is not anticipated by the Sutton reference.

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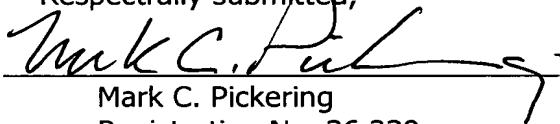
Conclusion

The Examiner's rejection is clearly erroneous and should be reversed.

Respectfully submitted,

Dated: 11-9-05

By:



Mark C. Pickering
Registration No. 36,239
Attorney for Applicant

30 Fifth Street, Suite 200
P.O. Box 300
Petaluma, CA 94953-0300
Telephone: (707) 762-5500
Facsimile: (707) 762-5504
Customer No. 33402

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CLAIMS APPENDIX

22. A silicon controlled rectifier comprising:

a first semiconductor region of a first conductivity type, the first semiconductor region having a dopant concentration;

a buried region of the first conductivity type, the buried region contacting the first semiconductor region and having a dopant concentration that is greater than the dopant concentration of the first semiconductor region;

a second semiconductor region of a second conductivity type that contacts the first semiconductor region, the second semiconductor region being spaced apart from the buried region, the second semiconductor region including all contiguous regions of the second conductivity type; and

a third semiconductor region of the first conductivity type that contacts the first semiconductor region, the third semiconductor region being spaced apart from the buried region and the second semiconductor region, and having a dopant concentration that is greater than the dopant concentration of the first semiconductor region.

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EVIDENCE APPENDIX

The Evidence Appendix is empty.

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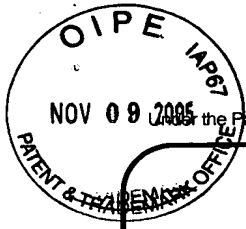
PATENT

RELATED PROCEEDINGS APPENDIX

The Related Proceedings Appendix is empty.

Appeal Brief

Atty. Docket No. 100-22600
(P05659)



TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

14

Application Number

10/649,989

Filing Date

August 27, 2003

First Named Inventor

Vladislav Vashchenko et al.

Group Art Unit

2814

Examiner Name

Long Pham

Attorney Docket Number

100-22600 (P05659)

ENCLOSURES (check all that apply)

☒ Fee Transmittal Form (in duplicate)

☒ Fee Attached (\$500)

☐ Amendment/Response

☐ After Final (Response)

☐ Affidavits/declaration(s)

☐ Extension of Time Request

☐ Express Abandonment Request

☐ Information Disclosure Statement

☐ Certified Copy of Priority Document(s)

☐ Response to Missing Parts/ Incomplete Application

☐ Response to Missing Parts under 37 CFR 1.52 or 1.53

☐ Assignment Papers (for an Application)

☐ Drawing(s)

☐ Licensing-related Papers

☐ Petition Routing Slip (PTO/SB/69) and Accompanying Petition

☐ Petition to Convert to a Provisional Application

☐ Power of Attorney, Revocation Change of Correspondence Address

☐ Terminal Disclaimer

☐ Request for Refund

☐ CD, Number of CD(s) _____

☐ After Allowance Communication to Group

☒ Appeal Brief

☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)

☐ Proprietary Information

☐ Status Inquiry

☒ Other Enclosure(s) (please identify below):

**Return Receipt Postcard
Express Mail No.
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Remarks

Please charge any necessary fees or credit overpayment to Deposit Account No. 502305. A duplicate copy of this transmittal is attached for this purpose.

Triplicate Copies of the Appeal Brief not included in accordance with 37 CFR §41.37(a)(1)

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name

Mark C. Pickering, Reg. No. 36,239

Signature

Date

November 9, 2005

CERTIFICATE OF EXPRESS MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage Express Mail No. EV590185896US in an envelope addressed to: Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this date:

November 9, 2005

Typed or printed name

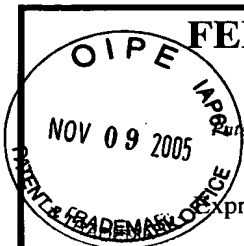
Robin L. King

Signature

Date

November 9, 2005

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



FEE TRANSMITTAL

For FY 2005

Patent Fees are subject to annual revision.

Express Mail No. EV590185896US

TOTAL AMOUNT OF PAYMENT \$500

METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge any fees or credit any overpayment under 37 CFR 1.16 and 1.17 which may be required by this paper to Deposit Account No. 502305

LAW OFFICES OF MARK C. PICKERING

☐ Applicant claims small entity status. See 37 CFR 1.27.

2. ☒ Payment Enclosed:

☒ Check ☐ Money Order ☐ Other

FEE CALCULATION

1. FILING FEE/SEARCH FEE/EXAMINATION FEE

LARGE ENTITY		SMALL ENTITY			
Fee Code	Fee (\$)	Fee Code	Fee (\$)	Description	Fee Paid
1011/1111/1311	1000	2011/2111/2311	500	Utility	
1012/1112/1312	430	2012/2112/2312	215	Design	
1013/1113/1313	660	2013/2113/2313	330	Plant	
1014/1114/1314	1400	2014/2114/2314	700	Reissue	
1005	200	2005	100	Provisional	
SUBTOTAL (1)					0

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

		Extra Claims	Fee from below	Fee Paid
Total Claims	* - 20 **	= 0	x 50	= \$ 0
Independent	* - 3	= 0	x 200	= \$ 0
Multiple Dep.			*	= \$ 0

** or number previously paid, if greater; for Reissues, see below:

Large Entity		Small Entity		
Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description
1202	50	2202	25	Claim in excess of 20
1201	200	2201	100	Independent claims in excess of 3
1203	360	2203	180	Multiple dependent claim, if not paid
1204	200	2204	100	** Reissue ind. claims over original patent
1205	50	2205	25	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) \$0

Complete if Known

Application Number 10/649,989
Filing Date August 27, 2003
First Named Inventor Vladislav Vashchenko et al.
Examiner Name Long Pham
Group Art Unit 2814

Attorney Document No. 100-22600 (P05659)

FEE CALCULATION (continued)

3. Additional Fees
Large Entity Small Entity
Fee Code Fee

1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2520	1812	2520	For filing a request for ex parte reexamination	
1804	920	1804	920	Requesting publication of SIR prior to Examiner action	
1805	1840	1805	1840	Requesting publication of SIR after Examiner action	
1251	120	2251	60	Extension for reply within first month	
1252	450	2252	225	Extension for reply within second month	
1253	1020	2253	510	Extension for reply within third month	
1254	1590	2254	795	Extension for reply within fourth month	
1255	2160	2255	1080	Extension for reply within fifth month	
1401	500	2401	250	Notice of Appeal	
1402	500	2402	250	Filing a brief in support of an appeal	500
1403	1000	2403	500	Request for oral hearing	
1451	1510	1451	1510	Petition to institute a public use proceeding	
1452	500	2452	250	Petition to revive-unavoidable	
1453	1500	2453	750	Petition to revive-unintentional	
1501	1400	2501	700	Utility issue fee (or reissue)	
1502	800	2502	400	Design issue fee	
1503	1100	2503	550	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	395	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	790	2810	395	For each additional invention be examined (37 CFR 1.129(b))	
1801	790	2801	395	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

*Reduced by Basic Filing Fee Paid SUBTOTAL (3) \$500

SUBMITTED BY

Law Offices of Mark C. Pickering
P.O. Box 300
Petaluma, CA 94953-0300
Telephone: (707) 762-5583
Facsimile: (707) 762-5504
Customer No. 33402

Date: 11-9-05
By: Mark C. Pickering
Mark C. Pickering, Reg. No. 36,239